OCCUPATIONAL ANALYSES SERIES

Ironworker (Generalist)

1993

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1993

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OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by an ironworker (generalist) whose occupational title has been identified by some provinces and territories of Canada under the following names:

Ironworker
Ironworker Fabrication
Ironworker Reinforcing Rebar
Ironworker Structural
Structural Steel Erector

LIST OF PUBLISHED OCCUPATIONAL ANALYSES *

Aircraft Gas Turbine Engine Repair and Overhaul Technician (1992)

Aircraft Structural Repair Technician (1992)

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Electronics Technician Vol. III (1986)
(Computer Equipment)

Electronics Technician Vol. IV (1986)
(Office Equipment)

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* **Red Seal analyses are indicated in bold.**

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(Signaling Equipment)

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(Navigation Equipment)

Electronics Technician Vol. IX (1986)
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(CADD Equipment)

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(CAM Equipment)

Electronics Technician Vol. XII (1987)
(Robotics Equipment)

Electronics Technician Vol. XIII (1987)
(Biomedical and Laboratory Equipment)

Electronics Technician Vol. XIV (1987)
(Industrial Process-Control Equipment)

Farm Equipment Mechanic (1981)

Floorcovering Installer (1991)

Glazier (1986)

Hairstylist (1992)

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Heavy Equipment Operator (1983)

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Motor Vehicle Body Repairer (1989)

Motor Vehicle Repairer (Truck and Transport) (1983)

New Home Builder and Residential Renovation Contractor (1992)

Oil and Solid Fuel Heating Mechanic (1986)

Painter and Decorator (1993)

Plumber (1989)

Power Engineer (1986)

Refrigeration and Air-Conditioning Mechanic (1989)

Roofer (1991)

Sheet Metal Worker (1990)

Sprinkler System Installer (1986)

Steamfitter-Pipefitter (1989)

Tool and Die Maker (1992)

Welder (1989)

REQUESTS FOR THESE PUBLICATIONS SHOULD BE FORWARDED TO:

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FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources Development Canada sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of interprovincial standards "Red Seal" examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of trainees and skilled workers; and
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a knowledgeable consultant who, with the assistance of a committee of industry experts in ironworking, identifies all the tasks performed in the occupation.

The draft is then assigned to occupational analysts at Human Resources Development Canada for review, translation and edit to ensure conformity with the nationally approved format.

The analysis is forwarded to provincial/territorial authorities for validation by specialists in the field. Their recommendations are assessed and incorporated into the final draft which also includes the identification of the common core tasks performed in the occupation.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

A. **BLOCK**	-	is the largest division within the analysis and reflects a distinct operation relevant to the occupation.
B. **TASK**	-	is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".
C. **SUB-TASK**	-	is the smallest division into which it is practical to sub-divide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Enabling Objectives

The element of skill and knowledge that an individual must acquire to perform the task adequately.

Trend

Any shifts or changes in technology that affect the sub-tasks are identified under this heading.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization Sub-Committee developed a method for the validation of the national Red Seal occupational analyses.

A draft of the analysis is sent to all provinces/territories for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the national occupational analyses identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Red Seal examinations.

DEFINITIONS

YES:	the sub-task is performed.
NO:	the sub-task is not performed.
BLOCK %:	the average time a worker spends performing each block in a given year in relation to other blocks of the analysis, taking into consideration the complexity (importance plus difficulty) of the block.
TASK %:	the average time a worker spends performing each task in relation to other tasks within the block, taking into consideration the complexity (importance plus difficulty) of the task.
NV:	Not Validated by the province/territory.
ND:	Not Designated in that province/territory.

COMMON CORE

The criteria for determining common core are dependant on the performance of sub-tasks. If 70% of the responding jurisdictions (excluding NVs and NDs) perform the sub-task, it shall be considered common core.

In the analysis, Block A is reserved for safety practices. Since safety practices are a mandatory feature of all occupations, it is considered common core and ratings are not required.

Interprovincial Red Seal examinations are based on the common core identified through this validation process.

PERCENTAGE RATINGS (APPENDIX "C")

In this appendix, blocks are assigned provincial and territorial percentage ratings. These figures represent the percentage of time a worker spends performing all tasks within the block, in a given year.

Tasks are also assigned a percentage rating which represents the approximate time spent by a worker on each task in relation to other tasks within the block.

The percentage totals, as submitted by the provinces/territories, equal 100% as do the national averages.

BLOCK PERCENTAGES (APPENDIX "D")

The graph depicts the national percentages assigned to blocks in the analysis, except for Block A which is not rated.

SCOPE OF ANALYSIS

An ironworker (generalist) is a skilled tradesperson who has a broad range of skills and knowledge which enable him/her to perform a variety of job related tasks. These diverse tasks include: erection of curtain wall, structural steel and precast concrete; laying and connecting reinforcing bars and tension cables; installation of ornamental ironwork, conveyors, and robotic equipment; and erection of hoists, derricks and cranes. Ironworkers are also frequently called upon to perform reconstructive work on existing structures such as buildings and bridges. They may also be involved in the demolition and salvage of all types of construction.

A competent ironworker is involved in all facets of the job including planning and coordination of equipment, materials and human resources; construction and demolition of structures; and salvage, storage and inventory of materials and equipment when jobs have been completed. All work must be performed in the context of personal safety for oneself and others during construction and for the end users afterward. Most ironworkers tend to specialize in certain aspects of the practice, such as structural steel erection, reinforcing steel installation, precast concrete erection, post-tensioning of cables, curtain wall finishing, machinery installation, etc.

Because of the size and mass of the construction materials and equipment used in ironworking, cranes and derricks are common and necessary features of the work site. Ironworkers must be thoroughly familiar with the operation of cranes and must be able to safely rig loads and communicate effectively with crane operators at all times.

This analysis covers a broad range of activities performed by ironworkers in Canada. Some of these activities are geographically limited. For example, the "erection of wooden structures" is an activity performed by ironworkers in Saskatchewan in support of the potash industry, and the "assembly of robotic equipment" is largely confined to the manufacturing sectors in Ontario. However, the great majority of the tasks described in this analysis are performed by ironworkers in all parts of Canada.

OBSERVATIONS AND TRENDS ARISING FROM ANALYSIS

The general practice of the ironworker trade has not changed dramatically over the last decade despite some important changes in building construction technology. Thus, while the activities performed by the ironworkers have remained relatively constant, the materials and equipment they work with have undergone a substantial change.

Essentially, every work activity of the ironworker is performed in strict compliance with safe work practices. In almost all cases, the responsibility for safety and safe work practice lies with the individual ironworker. This requires that individuals have extensive knowledge and awareness of the regulations pertaining to their industry and the equipment that they or others operate. This knowledge should begin with company safety policies and operational procedures, and should extend to the relevant municipal by-laws as well as provincial and federal legislations.

There is now a greater emphasis on and requirement for continuing education and training to keep pace with the advances in construction methods, construction materials and safe work practices. Because of the tremendous variety of tasks that they have to perform, ironworkers must be versatile in their knowledge and ability. Continuing education and training are necessary to enable individuals to respond to the diversity job calls which may range from laying of reinforcing bars for an expansive shopping complex to erecting communication towers reaching 100 m and beyond.

The opportunities for ironworkers to become certified will increase in the future. Pressure is being exerted to certify the trade in those provinces that do not currently support ironworker apprenticeship programs leading to certification.

Individuals can and should enter training programs to obtain certification in such areas as drawing reading, post-tensioning, inspection and restoration of aged structures and many other "specialty" areas. Advances in fastening methods, especially welding, also demand constant updating. Welding procedures such as tungsten-inert gas welding (TIG), gas metal arc welding (GMAW) and flux core arc welding (FCAW), formerly regarded as specialty techniques, are becoming more commonly used. As the list of weldable surfaces continues to expand, knowledge of both the technique and the appropriate application are required. Whereas in some jurisdictions ironworkers are being cross-trained as welders, in others, specific provisions restrict welding tasks to certified welders.

Increasingly, ironworkers are working with prefabricated and/or modular construction materials which carry a factory finish. This has led to the necessity for greater care and attention during storage, moving and erection of such materials. Rigging methods and devices in particular have evolved to accommodate these innovations. In erecting structures with prefabricated materials, ironworkers are frequently called upon to read, interpret and apply manufacturers' specifications for assembly and erection.

The increasing prevalence of prefabricated materials and modular components has resulted in a substantial decrease in on-site fabrication work. Instead, the emphasis has shifted to knowledge of the products of various manufacturers and how these products are assembled and erected.

Ironworkers require a thorough knowledge of cranes and hoisting operations. The ability to read and interpret crane charts and load sizes enables the ironworker to work safely and assess the potential for safety hazards.

ANALYSIS

BLOCK A SAFETY, ACCIDENT PREVENTION AND FIRST AID

Task 1 **Practices safety and maintains a safe work environment.**

Trend: Greater emphasis on individual worker knowledge and responsibility.

	Sub-tasks	Enabling Objectives	Tools & Equipment
1.01	Identifies and uses safety equipment.	knowledge of safety equipment	hearing protection, personal protective equipment, guards/ shields, protective clothing
1.02	Complies with safety regulations.	knowledge of federal, provincial and municipal standards and regulations applicable to the trade knowledge of Workers' Compensation Board regulations (WCB)	
1.03	Maintains a tidy and safe workplace.	knowledge of basic housekeeping routines	
1.04	Assesses potential workplace hazards.	knowledge of potential work hazards on-site and adjacent perimeter areas for public safety	
1.05	Handles hazardous materials.	knowledge of Workplace Hazardous Materials Information System (WHMIS) regulations and practice	
1.06	Applies first aid and cardiopulmonary resuscitation (CPR).	knowledge of basic first aid and CPR	
1.07	Knows and applies company safety regulations.	knowledge of company safety regulations	

	Sub-tasks	Enabling Objectives	Tools & Equipment
1.08	Installs, maintains and inspects safety equipment.	knowledge of fall arrest systems knowledge of trade practices	fall arrest systems (nets, ropes, tie lines, leashes, tethers)
1.09	Uses appropriate fire fighting equipment for type of fire.	knowledge of appropriate fire fighting equipment	fire extinguishers, personal protective equipment
1.10	Wears and uses appropriate personal protective equipment for task.	knowledge of personal protective equipment	dust mask, respirator, hearing protection, safety glasses, protective clothing
1.11	Calibrates and performs routine maintenance on instruments.	knowledge of calibration procedures	transit, level, torques wrenches, wrenches, skidmore

BLOCK B JOB PLANNING AND PREPARATION

Task 2 **Plans job in accordance with drawings, work site requirements and specifications.**

Trend: A greater awareness and understanding of project management is required.

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.01	Evaluates job site for hazards, laydown area, crate setting, prefab site, obstructions.	knowledge of communication skills knowledge of interpersonal skills knowledge of safety skills knowledge of common hazards	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
2.02	Shoots elevations.	knowledge of mathematical skills knowledge of survey instruments	transit, builder's level, laser levelling devices

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

2.03	Lays out grid lines or checks existing grid lines for proper placement.	knowledge of mathematical skills ability to use survey instruments	transit, level, laser levelling devices, plumb bob, chalk, piano wire, tape measure, square level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 3 **Coordinates delivery and installation of materials and equipment as job progresses.**

Trend: Greater use of prefabrication and modularization in industry resulting in elimination of job site work. Delivery and use of materials and equipment must be highly coordinated.

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.01	Coordinates delivery of materials as job progresses.	knowledge of communication skills knowledge of the trade ability to assess job progress	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.02	Develops and/or adjusts construction schedule.	knowledge of communication skills knowledge of organizational skills	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

3.03	Reads and interprets drawings and materials lists.	ability to read and interpret drawings and written instructions	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

3.04	Determines manpower requirements for job.	knowledge of organizational skills	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

3.05	Plans tool and equipment lists for job.	knowledge of tools and equipment pertaining to the job	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

3.06	Prepares shop drawings.	knowledge of basic drafting skills knowledge and awareness of pertinent building codes **(NOT COMMON CORE)**	basic drafting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	no	no	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
3.07	Prepares field sketches.	knowledge of materials and procedures ability to use survey instruments	basic drafting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

3.08	Properly handles and stores equipment and materials at job site.	knowledge of equipment and materials knowledge of appropriate storage practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

BLOCK C RIGGING AND MACHINERY MOVING

Task 4 **Prepares wire and fibre ropes and tackle.**

Trend: Greater use of nylon slings and chokers to protect factory finishes on construction materials.

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.01	Splices and/or knots wire and fibre ropes.	knowledge of various splices and their applications knowledge of breaking strengths	fid, marline spike, cable clips

Sub-tasks					Enabling Objectives						Tools & Equipment
					knowledge of safe working capacities						
					knowledge of knots						
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND
4.02	Reeves or laces blocks.				knowledge of reeving and lacing methods and their advantages and applications						Crescent wrench, cable clips, ratchet wrench
					knowledge of frictions and weights						
					knowledge of knots						
					knowledge of methods to determine mechanical advantage						
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND
4.03	Inspects, measures and cuts wire and fibre rope according to end use.				knowledge of methods of inspecting rope						tape measure, cutting torch, cable cutters, cutoff saw, electrician's tape, material for seizing/whipping
					knowledge of visual signs of deterioration						
					knowledge of end uses						
NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND
4.04	Selects correct fibre or wire rope and blocks				knowledge of safe working capacities						

	Sub-tasks	Enabling Objectives	Tools & Equipment
	according to job requirements.	knowledge of breaking strengths	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

4.05	Selects and installs correct cable clip with appropriate spacing.	knowledge and application of spacing formula knowledge of clip varieties and applications knowledge of safety factors	cable clips, wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

4.06	Selects appropriate turnbuckles.	knowledge of load safety factors knowledge of appropriate formulae	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

4.07	Splices an eye in wire or fibre rope.	knowledge of various eye splicing techniques and their proper uses	fid, marline spike, cable clips, wire cutters, compression fitting

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
4.08	Fabricates and installs guy wires.	knowledge of safe working practices (SWP) knowledge of breaking strength knowledge of clip spacing knowledge of thimble size	turnbuckles, thimbles, cable clips, cable cutters, torch, plumb lines, buffalo grips, magnus or rolling hitch, come-alongs

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

4.09	Assembles and operates block and tackle.	knowledge of knots and their proper applications	chokers, U-bolts

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

4.10	Secures equipment/loads into temporary position with lashings	knowledge of SWP knowledge of use of clips, turnbuckles and shackles	wire rope, clips, turnbuckles, adjustable wrench, ratchet wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 5 **Rigs and moves loads.**

Trend: Greater emphasis on engineered lifts. Hoisting equipment is bigger and capable of hoisting larger loads.

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.01	Determines weight of load and identifies	knowledge of SWP	dynamometer, crane

	Sub-tasks	Enabling Objectives	Tools & Equipment
	appropriate hoisting equipment.	knowledge of hoisting equipment	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

5.02	Determines placement of load.	knowledge of planning and preparation ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

5.03	Selects and operates appropriate moving or hoisting apparatus.	knowledge of SWP knowledge of breaking strengths knowledge of safe operation of moving equipment knowledge and interpretation of crane charts	come-alongs, Tirfors, hydraulic jacks, chain block hoist, tugger, fork lift, stinger, rollers, air pallets, bents, form boom, dunnage

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

5.04	Selects appropriate rigging for application.	knowledge of riggings knowledge of SWP knowledge of breaking strength	spreader bar, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
5.05	Identifies appropriate hoisting points and rigs load.	knowledge of hoisting points knowledge of safe rigging practices	rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

5.06	Directs crane operator to raise, move or lower load.	knowledge of crane signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

5.07	Operates boom trucks and carry-deck cranes.	knowledge of equipment operation procedures **(NOT COMMON CORE)**	boom trucks, carry-deck cranes

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	no	no	yes	ND	ND

BLOCK D ERECTION OF HOISTING AND CONVEYANCE EQUIPMENT

Task 6 **Assembles, erects, jumps and dismantles tower cranes.**

Trend: Tower cranes are bigger, heavier and capable of lifting larger loads.

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.01	Off-loads, inventories and lays out components of tower crane.	knowledge of erection sequence familiarity with variety of tower cranes knowledge of SWP knowledge of suitable site elevations knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	mobile crane, fork lift, chokers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.02	Levels and plumbs base section of the mast.	knowledge of erection procedures knowledge of hand tools knowledge of nature of reinforced concrete knowledge of SWP	transit, level, shims, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.03	Installs jacking section.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components	strut offset wrench, spud wrench, hammer wrench, multiplier, torque wrenches, tag lines, rigger's belt

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.04	Erects and secures mast.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices knowledge and use of hydraulic jacks	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, guylines, sledgehammers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.05	Installs turntable section on mast.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.06	Installs and secures counterweight section (without counterweights).	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.07	Installs trolley and pennant lines on boom.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.08	Installs and secures boom.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines

Sub-tasks		Enabling Objectives	Tools & Equipment
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.09	Installs and secures counterweights.	knowledge of and familiarity with variety of tower cranes	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines
		knowledge of erection sequence	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.10	Inspects and torques bolts to manufacturer's specifications.	knowledge of and familiarity with variety of tower cranes	torque wrenches, multiplier
		knowledge of erection sequence	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.11	Reeves block and sheaves along mast and boom.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	cable clips, adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.12	Installs and adjusts trolley travel cable.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.13	Ensures that tower crane has power.	ability to co-ordinate work with other tradespersons	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
6.14	Performs load tests on tower crane and adjusts limit switches to manufacturer's specifications.	knowledge of and familiarity with variety of tower cranes knowledge of SWP knowledge of crane components knowledge of safe rigging practices ability to co-ordinate work with other tradespersons	slings, chokers, screwdriver

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	no	yes	yes	ND	ND

6.15	Performs final visual inspection of all tower crane components.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.16	Jumps tower crane using built-in jacking system.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components	hydraulic jacks, wedges, sledgehammers

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of crane signals	
	knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.17	Jumps tower crane by adding additional mast sections.	knowledge of and familiarity with variety of tower cranes knowledge of erection sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

6.18	Dismantles tower crane at end of construction.	knowledge of dismantling sequence knowledge of SWP knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	come-alongs, ring hammer, multiplier, torque wrenches, pins, hammer wrench, sledgehammers, tag lines, derrick, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 7 **Assembles, erects, jumps and dismantles various derrick types.**

Trend: No apparent change.

	Sub-tasks	Enabling Objectives	Tools & Equipment
7.01	Off-loads, inventories and lays out derrick components.	knowledge of erection sequence knowledge of and familiarity with various derrick types knowledge of SWP knowledge of suitable site elevations knowledge of components knowledge of crane signals knowledge of safe rigging practices	dunnage, crane, fork lift, chokers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.02	Installs spider on mast of guy derrick or stiff legs on stiffleg derrick.	knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	adjustable wrenches, spud wrench, drift pins, sledgehammers, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.03	Positions and secures hoist drum.	knowledge of erection sequence knowledge of SWP	hammer drill, anchor bolts, appropriate wrenches, crane

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of crane signals	
	ability to use hand tools	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.04	Levels and plumbs base section of derrick.	knowledge of levelling procedures	transit, hand level, shims, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.05	Installs boom cadle bridle on mast.	knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	adjustable wrenches, ratchet wrench, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.06	Erects, plumbs and guys dressed mast section(s).	knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	turnbuckles, cables, tag lines, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
7.07	Installs boom section to mast base.	knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	sledgehammers, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.08	Reeves hoist block.	knowledge of reeving procedures knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	clip wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.09	Performs visual inspection of all components.	knowledge of equipment and operation knowledge of erection sequence knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.10	Establishes lines of communication and conducts performance tests.	knowledge of communication signals knowledge of erection sequence	radio, bells, lights

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of equipment and operation	
	knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.11	Jumps derrick as work progresses using approved procedures.	knowledge of erection sequence knowledge of SWP knowledge of crane signals ability to use hand tools	clip wrench, spud wrench, come-alongs, Tirfors, sledgehammers	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

7.12	Dismantles derrick at end of construction.	knowledge of dismantling sequence knowledge of SWP knowledge of crane signals ability to use hand tools	crane, slings, ropes, sledgehammers, dunnage, wrenches	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 8 **Assembles and dismantles conventional and hydraulic cranes.**

Trend: Conventional cranes are larger, with greater hoisting capabilities.

	Sub-tasks	Enabling Objectives	Tools & Equipment
8.01	Off-loads, inventories and lays out crane components.	knowledge of and familiarity with various conventional cranes knowledge of erection sequence knowledge of and familiarity with variety of equipment in this area knowledge of SWP knowledge of suitable site elevations knowledge of crane components knowledge of crane signals knowledge of safe rigging practices	slings, chokers, tag lines, crane, dunnage

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.02	Prepares site for crane assembly.	knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of suitable site elevations ability to use hand tools	site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.03	Levels crane and sets outriggers, if necessary.	knowledge of and familiarity with various conventional and hydraulic cranes knowledge of erection sequence	dunnage, level

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of and familiarity with variety of equipment in this area	
	knowledge of SWP	
	knowledge of suitable site elevations	
	knowledge of crane components	
	knowledge of crane signals	
	knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.04	Installs counterweights, if necessary.	knowledge of and familiarity with various conventional cranes	crane
		knowledge of erection sequence	
		knowledge of and familiarity with variety of equipment in this area	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.05	Assembles and attaches boom to heel section on conventional crane.	knowledge of and familiarity with various conventional cranes	sledgehammers
		knowledge of erection sequence	

Sub-tasks					Enabling Objectives						Tools & Equipment
					knowledge of and familiarity with variety of equipment in this area						
					knowledge of SWP						
					knowledge of crane components						
					knowledge of crane signals						
					knowledge of safe rigging practices						

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.06	Attaches jib to boom, if necessary.	knowledge of and familiarity with various conventional and hydraulic cranes	sledgehammers
		knowledge of erection sequence	
		knowledge of and familiarity with variety of equipment in this area	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.07	Reeves boom cable bridle on conventional crane.	knowledge of and familiarity with various conventional cranes	
		knowledge of erection sequence	

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of reeving procedures	
	knowledge of and familiarity with variety of equipment in this area	
	knowledge of SWP	
	knowledge of crane components	
	knowledge of crane signals	
	knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.08	Attaches pennant lines to bridle on conventional crane.	knowledge of and familiarity with various conventional cranes	sledgehammers
		knowledge of erection sequence	
		knowledge of and familiarity with variety of equipment in this area	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.09	Reeves cable to main load block.	knowledge of and familiarity with various conventional and hydraulic cranes	adjustable wrenches, ratchet wrench
		knowledge of erection sequence	

Sub-tasks					Enabling Objectives					Tools & Equipment		
					knowledge of reeving procedures							
					knowledge of and familiarity with variety of equipment in this area							
					knowledge of SWP							
					knowledge of crane components							
					knowledge of crane signals							
					knowledge of safe rigging practices							
	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
	ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND
8.10	Attaches whip line to headache ball, if necessary.				knowledge of and familiarity with various conventional and hydraulic cranes						adjustable wrenches, ratchet wrench	
					knowledge of erection sequence							
					knowledge of and familiarity with variety of equipment in this area							
					knowledge of SWP							
					knowledge of crane components							
					knowledge of crane signals							
					knowledge of safe rigging practices							
	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
	ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND
8.11	Performs final visual inspection of crane components.				knowledge of and familiarity with various conventional and hydraulic cranes							
					knowledge of erection sequence							

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of SWP	
	knowledge of crane components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.12	Directs crane operator to raise boom.	knowledge of crane signals	
		knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.13	Directs operator to lower boom when work has been completed.	knowledge of crane signals	
		knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

8.14	Dismantles crane.	knowledge of and familiarity with various conventional and hydraulic cranes	crane, slings, chokers, tag lines, dunnage, sledgehammers, ratchet wrench, adjustable wrenches
		knowledge of dismantling sequence	
		knowledge of SWP	
		knowledge of crane components	
		knowledge of crane signals	
		knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 9 **Assembles, erects, jumps and dismantles material and personnel hoists.**

Trend: Hoists are getting lighter and more compact.

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.01	Off-loads, inventories and lays out components of a hoist.	knowledge of and familiarity with a variety of material and personnel hoisting devices knowledge of erection sequence knowledge of SWP knowledge of suitable site elevations knowledge of hoist components knowledge of crane signals knowledge of safe rigging practices	dunnage, crane, fork lift, chokers, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.02	Evaluates condition and suitability of base.	knowledge of the nature of reinforced concrete	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.03	Installs anchor bolts, if necessary.	knowledge of welding and cutting procedures ability to select proper bolts and anchors	welding and cutting equipment, hammer drill

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.04	Levels, aligns and secures base section on foundation.	knowledge of use of hand tools knowledge of levelling procedures	level, shims, rigger's belt

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.05	Applies grout between base and foundation, where required.	ability to prepare and apply grout	trowel, mixing container, grout

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	no	yes	ND	ND

9.06	Assembles and bolts sections of hoist tower on the ground.	knowledge of erection sequence knowledge of hoist components knowledge of SWP	torque wrenches, adjustable wrenches, spud wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.07	Attaches guide rails, if necessary.	knowledge of hoist components knowledge of SWP	torque wrenches, adjustable wrenches, spud wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.08	Rigs tower section and signals the operator to hoist into place.	knowledge of hoist components knowledge of erection sequence	crane, slings, tag lines

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.09	Aligns and secures tower to base section.	knowledge of SWP knowledge of alignment procedures	crane, slings, impact wrench, tag lines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.10	Installs tie-ins to existing structure.	knowledge of welding and cutting procedures ability to select proper bolts ability to select proper anchors	hammer drill, welding equipment, cutting torch

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.11	Directs hoisting and installs cathead on top of hoist tower.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	crane, tag lines, chokers, slings, torque wrenches, impact wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.12	Installs electric hoisting device.	knowledge of SWP knowledge of hoist components knowledge of crane signals knowledge of safe rigging practices knowledge of erection sequence	crane, tag lines, chokers, slings

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.13	Attaches wire rope cable on hoist tower drum.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	crane, tag lines, chokers, slings

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.14	Installs lift platform on tower.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	crane, tag lines, chokers, slings

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.15	Installs cable through blocks and cathead and attaches to lifting platform.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.16	Installs counterweights, if necessary.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.17	Installs gates or doors, where appropriate.	knowledge of hoist components knowledge of welding and cutting knowledge of proper use of hammer drills knowledge of anchors knowledge of SWP	welding and cutting equipment, hammer drill

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.18	Installs telephone, sound or light signalling system.	knowledge of procedures to install signalling system knowledge of SWP knowledge of hoist components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	no	yes	no	yes	ND	ND

9.19	Conducts visual inspection of all components.	knowledge of hoist components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.20	Conducts load test and adjusts limits to manufacturer's specifications.	ability to operate hoist ability to read and interpret charts	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

9.21	Adds additional sections as building progresses.	knowledge of hoist components knowledge of erection sequence knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	crane, tag lines, chokers, slings, torque wrenches, sledgehammers, rigger's belt

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
9.22	Dismantles hoist when building is complete.	knowledge of dismantling sequence knowledge of hoist components knowledge of techniques for storing hoists and ropes knowledge of SWP knowledge of crane signals knowledge of safe rigging practices	crane, tag lines, chokers, slings, torque wrenches, sledgehammers, rigger's belt, cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 10 **Installs support structures, framework and related structural and mechanical equipment for conveying systems and material handling systems.**

Trend: Components are more often preassembled; less emphasis on field fabrication; greater complexity of conveyance systems due to inclusion of computer-aided manufacturing; organization of work more systematized.

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.01	Prepares job site for laydown areas, preassembly areas, storage areas, access, etc.	knowledge of job sequence and requirements	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.02	Off-loads and inventories equipment, components and materials.	knowledge of hoisting signals knowledge of rigging procedures	fork lift, crane, rigging equipment, rigger's belt, dunnage

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of materials and components	
	knowledge of SWP	
	knowledge of care and handling of finished materials	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.03	Identifies, sorts and properly stores components and material in accordance with job progress requirements.	ability to identify components knowledge of job sequence knowledge of proper storage environment ability to assess suitability of storage areas	fork lift, crane, rigging equipment, dunnage, rigger's belt

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.04	Lays out grid lines and shoots elevations.	knowledge of survey procedures and use of equipment ability to read and interpret drawings	transit, builder's level, survey equipment, plumb bob, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.05	Rigs components and support systems according to application.	knowledge of various rigging applications	fork lift, crane, rigging equipment, dunnage, rigger's belt

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to improvise within safe trade practice	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.06	Assembles and installs support systems where required according to specifications.	knowledge of welding and cutting procedures ability to read and interpret drawings	welding and cutting equipment, hand tools, power tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.07	Assembles and installs conveying components according to specifications.	knowledge of conveyor components knowledge of erection sequence knowledge of installation procedures	adjustable wrenches, spud wrench, come-alongs, Tirfors, sledgehammers, fork lift, crane, rigging equipment, dunnage, rigger's belt, hand tools, power tools, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.08	Assembles and installs drive components and other mechanical equipment according to specifications.	knowledge of drive components and assembly procedures ability to read and interpret drawings	rigger's belt, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.09	Sets components to proper elevation and alignment.	ability to use surveying equipment	rigger's belt, transit, builder's level, survey equipment, plumb bob, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.10	Connects all drive assembly components.	knowledge of connection procedures ability to read and interpret drawings	rigger's belt, hand tools, power tools, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.11	Installs safety system, such as limit switches, guards, cages, shut-offs, etc., according to specifications and regulations.	knowledge of manufacturer's specifications and local regulations ability to read and interpret drawings	rigger's belt, hand tools, power tools, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.12	Performs visual inspection of all completed work.	knowledge of standards knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
10.13	Performs test run and troubleshoots conveyance and safety systems.	knowledge of components and their interactive function	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.14	Adjusts components, as necessary.	knowledge of components and their interactive function	hand tools, power tools, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

10.15	Conducts final inspection of all completed work.	knowledge of standards knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

BLOCK E ERECTION OF STRUCTURAL IRONWORK

Task 11 **Erects structural steel framework for buildings, bridges and towers.**

Trend: Larger and heavier structures are being erected with larger equipment. There is a greater emphasis on worker safety and adherence to seismic specifications.

	Sub-tasks	Enabling Objectives	Tools & Equipment
11.01	Prepares job site for storage of material.	knowledge of erection sequence	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.02	Off-loads, identifies and sorts steel members and other construction materials.	knowledge of erection sequence knowledge of hoisting signals knowledge of SWP knowledge of breaking strengths knowledge of safe rigging practices	dunnage, crane, tag lines, chokers, connecting bar, spreaders, shackles, hooks

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.03	Stores material in a safe and orderly manner.	knowledge of erection sequence	dunnage, crane, tag lines, chokers, connecting bar, spreaders

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.04	Hooks on to structural member.	knowledge of safe rigging practices knowledge of breaking strengths	crane, shackles, tag lines, softeners, chokers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
11.05	Signals operator to lift and spot steel members into position.	knowledge of hoisting signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.06	Accepts and secures structural members into position.	knowledge of hoisting signals ability to climb	crane, fasteners, rigger's belt, wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.07	Installs temporary bracing, floats and scaffolding, where and as necessary.	knowledge of bracing procedures knowledge of breaking strengths knowledge of clips and spacing knowledge of welding and cutting procedures knowledge of knots ability to select appropriate clips, etc. ability to read and interpret drawings	guylines, turnbuckles, wire rope, wire rope clips, planks, welding equipment, come-alongs, buffalo grips, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.08	Aligns components with pins and bolts.	ability to select proper fasteners	sledgehammers, barrel

Sub-tasks	Enabling Objectives	Tools & Equipment
		pins, drift pins, reamer, impact wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.09	Plumbs up structural framework.	ability to use hand tools	hand tools, plumb bob, transit, level, turnbuckles, guylines

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.10	Selects and installs appropriate fasteners according to specifications.	ability to use hand tools	rigger's belt, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.11	Impacts and torques fasteners to specifications.	knowledge of and ability to use air or power tools	impact wrench, torque wrenches, air hoses, air compressor, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.12	Welds structural members as required by specifications.	ability to weld	welding and cutting equipment

Sub-tasks	Enabling Objectives	Tools & Equipment

Note: Involvement in welding is subject to provincial/territorial regulations.

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.13	Removes all temporary bracing, floats and scaffolding as well as alignment devices.	knowledge of hand signals knowledge of welding and cutting procedures ability to use hand tools	torch, grinder, block and tackle, tag lines, sledgehammers, crane, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

11.14	Performs visual and mechanical inspection of work completed.	knowledge of standards knowledge of and ability to use calibration tools	torque wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 12 Erects metal storage tanks, bins and hoppers.

Trend: Structural components are larger. Prefabricated components are of better quality.

Sub-tasks	Enabling Objectives	Tools & Equipment
12.01 Prepares job site.	knowledge of components knowledge of erection sequence	crane, dunnage, site preparation equipment

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of safe rigging practices	
	knowledge of crane signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.02	Off-loads, identifies and sorts tank, bin or hopper components.	knowledge of hoisting procedures knowledge of SWP knowledge of breaking strengths knowledge of safe rigging practices	dunnage, crane, tag lines, chokers, connecting bar, spreaders, plate clamps, equalizer beam

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.03	Prepares components for assembly and erection.	knowledge of welding and cutting procedures knowledge of grinding procedures knowledge of joint preparation knowledge of SWP	grinder, torch, buffer, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.04	Bolts, rivets and welds components together according to specifications.	knowledge of welding and cutting procedures knowledge of riveting and bolting practices	welding and cutting equipment, wedges, dogs, keys, impact wrench, air compressor,

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of SWP	riveting equipment (air or electric)

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.05	Erects scaffolding or steel framework, where and as necessary.	knowledge of erection procedures knowledge of SWP knowledge of regulations pertaining to scaffolds knowledge of welding and cutting procedures	crane, tag lines, clips, scaffold brackets, planks, #9 wire, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.06	Attaches rigging devices to components.	knowledge of safe rigging practices	chokers, slings, beams, shackles, plate clamps

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.07	Signals hoisting operator to lift and spot components into position.	knowledge of hoisting signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
12.08	Accepts component at proper elevation and guides into place.	knowledge of construction sequence knowledge of components knowledge of hoisting signals	tag lines, connecting/ aligning bar, come-alongs

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.09	Secures components temporarily in place with appropriate fastening methods.	knowledge of welding and cutting procedures knowledge of riveting and bolting procedures knowledge of SWP	welding and cutting equipment, come-alongs

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.10	Aligns and levels components.	ability to use hand tools	wedges, level, plumb bob, dogs, keys, rigger's belt, sledgehammers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.11	Secures components permanently in place by bolting, welding or riveting according to specifications.	knowledge of welding and cutting procedures knowledge of riveting and bolting procedures knowledge of SWP	welding and cutting equipment, riveting equipment, impact wrench, compressor, torque wrenches

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to interpret torque charts	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.12	Seals joints in tanks, bins or hoppers, where specified.	knowledge of welding and cutting procedures ability to apply caulk ability to identify and use specific sealants	caulking gun, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.13	Performs visual inspection and testing where applicable.	knowledge of and ability to perform tests	testing apparatus

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

12.14	Removes scaffolding, etc., as work progresses.	knowledge of SWP knowledge of welding and cutting procedures knowledge of crane signals	tag lines, crane, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
12.15	Repairs damage to surfaces where required.	ability to grind and paint	grinder, paint, paint brushes

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 13 **Assembles and erects pre-engineered buildings, bridges, silos and similar structures.**

Trend: There is a greater variety and availability to pre-engineered structures. Ironworkers are expected to read and interpret manufacturers' instructions for assembly of pre-engineered structures.

	Sub-tasks	Enabling Objectives	Tools & Equipment
13.01	Prepares job site by planning for laydown areas, storage areas, preassembly areas, access, etc.	knowledge of erection procedures knowledge of SWP ability to read and interpret drawings	site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.02	Off-loads and inventories equipment, components and materials.	knowledge of materials knowledge of erection sequence knowledge of finishes knowledge of bills of lading knowledge of material lists knowledge of manufacturer's handling specifications	wrecking bar, fork lift, dunnage, hoisting equipment, rigging equipment

Sub-tasks		Enabling Objectives		Tools & Equipment
		ability to identify components		

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.03	Lays out grid lines and shoots elevations.	knowledge of survey procedures and use of equipment ability to read and interpret drawings	transit, builder's level, survey equipment, plumb bob, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.04	Preassembles components where possible.	knowledge of components knowledge of assembly sequence knowledge of fastening procedures	impact wrench, rigger's belt, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.05	Directs operator to hoist components into position.	knowledge of hoisting signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.06	Aligns, levels and plumbs components.	knowledge of erection procedures ability to use surveying equipment	levelling device, squares, tugger, crane, plumb bob, transit, come-alongs, chain

Sub-tasks	Enabling Objectives	Tools & Equipment
		block hoist, Tirfors, crowbar

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.07	Torques bolts to secure components in place.	knowledge of torque specifications ability to read and interpret drawings	impact wrench

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.08	Installs roofing, cladding and insulation, as required.	ability to read and interpret drawings	impact wrench, stapler, screw-guns, drills, utility knife, caulking gun, mastic, crane, vice grip, tin snips, nibbler (also swing stage scaffolding, where required)

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

13.09	Installs man doors, roll-up doors and windows, as required.	ability to read and interpret drawings	impact wrench, stapler, screw-guns, drills, utility knife, caulking gun, mastic, crane, vice grip, tin snips, nibbler (also swing stage scaffolding, where required)

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 14 **Assembles and installs curtain walls, window walls, doorways, store fronts, revolving doors, mantraps, etc. in and on buildings.**

Trend: Greater prevalence of pre-assembled panel sections assembled with non-traditional materials; increasing use of plastic rather than glass; level of activity increasing, with individual worker more specialized in erection of curtain wall.

	Sub-tasks	Enabling Objectives	Tools & Equipment
14.01	Prepares job site by planning laydown areas, assembly areas, cranes location, etc.	knowledge of job sequence and requirements	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.02	Off-loads, identifies and sorts components, equipment and materials.	knowledge of hoisting signals knowledge of rigging procedures knowledge of materials and components knowledge of SWP knowledge of care and handling of finished materials	fork lift, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.03	Measures and marks layout for installation according to specifications and erection sequence.	ability to read and interpret drawings ability to use tools	transit, laser levelling devices, chalk line, tape measure, swing stage

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to assemble and safely operate swing stage	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.04	Verifies correct location of embedments, if necessary.	knowledge of layout material ability to read and interpret drawings	transit, laser levelling devices, chalk line, swing stage

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.05	Drills holes in existing structures, as required.	knowledge of layout material ability to read and interpret drawings	drills

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.06	Installs support clips on structure, as required or specified.	knowledge of welding and cutting procedures	ratchet wrench, welding and cutting equipment, torch, C-clamps

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.07	Assembles sections to be installed, as necessary.	knowledge of installation procedures knowledge of manufacturer's specifications	screw-guns, hand drills, pop riveter, cutoff saw, file

	Sub-tasks	Enabling Objectives	Tools & Equipment
		ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.08	Hoists assembled sections into predetermined location.	knowledge of hoisting signals knowledge of SWP knowledge of safe rigging practices	electric hoist, crane, pallet lifter, A-frame hoisting device

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.09	Interlocks section with standing sections, as necessary.	knowledge of manufacturer's specifications ability to read and interpret drawings	glazing bar, come-alongs, C-clamps

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.10	Aligns and levels assembled sections.	knowledge of erection procedures ability to use surveying equipment	piano wire, chalk line, builder's level, plumb line, transit

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.11	Fastens the assembly.	knowledge of welding and cutting procedures knowledge of fastening methods	welding and cutting equipment, ratchet wrench, hand tools

Sub-tasks	Enabling Objectives	Tools & Equipment
	ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.12	Applies back-beading to curtain wall.	knowledge of caulking and sealant procedures ability to use hand tools	caulking gun, putty knife

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.13	Installs glass, plastic or other material in prepared framework, cutting material to size, if necessary.	knowledge of glazing skills awareness of variation in materials	glazing bar, plastic spreaders, glass cutter, suction cups

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.14	Verifies alignment and secures glass, plastic or other material in place.	knowledge of manufacturer's specifications ability to read and interpret drawings ability to use appropriate tools	appropriate tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
14.15	Applies sealer or sealant around glass according to specifications.	knowledge of caulking and sealant procedures knowledge of manufacturer's specifications	caulking gun

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

14.16	Applies flashing (air seal) according to specifications.	knowledge of manufacturer's specifications knowledge of safe use of explosive-actuated tools ability to use hand tools	explosive-actuated tool, pop riveter, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 15 **Installs ornamental and miscellaneous ironwork and non-ferrous components, such as stairways, railings, panels, catwalks, fences, sound barriers, vehicle guard rails, etc.**

Trend: Greater prevalence of prefabricated components; more intricate designs.

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.01	Prepares job site by planning laydown areas, assembly areas, cranes location.	knowledge of job sequence and requirements	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.02	Off-loads, identifies and sorts components, equipment and materials.	knowledge of hoisting signals knowledge of rigging procedures knowledge of materials and components knowledge of SWP knowledge of care and handling of finished materials	fork lift, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.03	Measures and marks layout for installation according to erection sequence.	ability to assemble and safely operate swing stage ability to read and interpret drawings ability to use tools	transit, laser levelling devices, chalk line, swing stage, rigger's belt

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.04	Verifies correct location of embedments, if necessary.	knowledge of layout material ability to read and interpret drawings	hammer, water level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.05	Drills holes in existing structures, as required.	knowledge of layout material ability to read and interpret drawings	drills

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.06	Installs support clips, as required or specified.	knowledge of various welding procedures, such as stainless, aluminum and mild steel	ratchet wrench, welding and cutting equipment, torch, C-clamps

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.07	Assembles sections to be installed, as necessary.	knowledge of field fabrication procedures ability to improvise tools	screw-guns, hand drills, cutoff saw, file, dogs, wedges, bar clamps, come-alongs, crane, grinder, pony clamps, welding machine

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.08	Hoists assembled sections into predetermined locations.	knowledge of hoisting signals knowledge of SWP knowledge of safe rigging practices	crane, rigging equipment, chain block hoist, come-alongs, electric hoist, tugger

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.09	Aligns, levels and plumbs components according to specifications/regulations.	knowledge of erection procedures knowledge of use of surveying equipment	levelling device, squares, tugger, crane, plumb bob, transit, come-alongs, chain block hoist, Tirfors, crowbar

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
15.10	Fastens components into permanent position.	knowledge of welding and cutting procedures knowledge of fastening methods ability to read and interpret drawings	welding machine, hammer drill, impact wrench, ratchet wrench, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

15.11	Performs cosmetic finishing, such as grinding, painting, filling, installing caps, cladding, etc.	knowledge of finishing procedures	grinder, paint, paint brushes, file, polishes, heater, sandpaper

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 16 **Erects structural and architectural precast concrete components for buildings, bridges, towers and other structures.**

Trend: No apparent change.

	Sub-tasks	Enabling Objectives	Tools & Equipment
16.01	Prepares job site by planning temporary laydown areas, storage areas and cranes location.	knowledge of job sequence and requirements	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
16.02	Lays out grid lines and shoots elevations.	knowledge of survey procedures and use of equipment ability to read and interpret drawings	transit, builder's level, survey equipment, plumb bob, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.03	Verifies correct location and condition of embedments, if necessary.	knowledge of layout material ability to read and interpret drawings	hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.04	Off-loads and inventories equipment, components and material.	knowledge of hoisting signals knowledge of rigging procedures knowledge of materials and components knowledge of SWP knowledge of care and handling of finished materials	fork lift, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.05	Stores material and components in a safe and orderly manner.	knowledge of materials and storage practices knowledge of erection sequence	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
16.06	Installs support clips or bearing pads on structure or component, as specified or required.	ability to read and interpret drawings ability to use hand tools	rigger's belt, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.07	Assembles proper rigging for hoisting component.	knowledge of SWP knowledge of rigging procedures	rigger's belt, rigging equipment
16.08	Directs operator to hoist component into approximate position.	knowledge of crane signals	
16.09	Aligns, levels and plumbs component.	knowledge of plumbing methods	plumb bob, level, transit
16.10	Secures component in place by following specified fastening methods.	knowledge of appropriate fastening methods and materials	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
16.11	Disconnects rigging from component.	knowledge of SWP knowledge of crane signals	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.12	Installs gaskets, packing, caulking, air seal, etc., as specified.	ability to read and interpret drawings	caulking gun

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.13	Performs visual inspection of work completed.	knowledge of components knowledge of standards	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

16.14	Performs cosmetic finishing, such as patching, grouting, removal of lugs, etc.	ability to grind and paint ability to prepare and apply grouting, patching, etc.	paint, paint brushes, grinder, cutting torch, grout mixer, pump and accessories

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 17 **Inspects or tests structures and equipment for deterioration, defects, non-compliance with specifications or regulations and unsafe conditions during or after construction.**

Trend: Inspections occur with greater frequency, particularly as structures age and are affected by weather conditions. Inspectors must have broad knowledge of construction methods and materials.

	Sub-tasks	Enabling Objectives	Tools & Equipment
17.01	Studies drawings or specifications of installation to be tested or inspected.	knowledge of structural drawings knowledge of specifications knowledge of construction materials ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

17.02	Devises a valid inspection sequence or procedure, as required.	knowledge of SWP knowledge of construction methods	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

17.03	Performs visual and mechanical inspection of installation to determine if connected or fastened material is properly placed and secured.	knowledge of SWP knowledge of fastening methods knowledge of construction standards	torque wrenches, tape measure, multiplier, hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

17.04	Checks symbols or identifying marks on construction materials.	knowledge of symbols ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
17.05	Tests installation of studs.	knowledge of testing procedures	hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

17.06	Tests rivets to determine tightness and soundness.	knowledge of testing procedures	hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

17.07	Visually inspects surfaces of structures and equipment for faults, such as cracks, deterioration and corrosion.	knowledge of SWP knowledge of construction materials	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 18 **Dismantles building framework, bridges, tanks, silos or other structures made of metal, precast concrete or laminated timbers.**

Trend: Greater requirement to dismantle structures with minimum damage for purposes of reassembly or salvage.

	Sub-tasks	Enabling Objectives	Tools & Equipment
18.01	Prepares work area and positions hoisting equipment in proper location.	knowledge of job sequence	site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
18.02	Ensures all utilities, such as gas and electricity, are disconnected or de-energized.	knowledge of standards and conventions of supplying services to structures	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.03	Selects storage area for materials to be salvaged.	knowledge of storage procedures	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.04	Matches mark components for salvage as work progresses, if necessary.	knowledge of uses/value of salvage knowledge of job sequence ability to read and interpret drawings	marking tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.05	Calculates weights and selects proper rigging for each lift.	knowledge of rigging procedures ability to calculate weights knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.06	Connects slings, chokers, spreaders or other rigging	knowledge of rigging procedures	rigger's belt, rigging equipment

	Sub-tasks	Enabling Objectives	Tools & Equipment
	equipment to structural component.	knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.07	Dismantles or removes miscellaneous structure components.	knowledge of dismantling procedures	hoisting equipment, power tools, hand tools, cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.08	Positions lifting cable from hoisting equipment directly over centre of balance of member to be removed.	knowledge of rigging procedures knowledge of hoisting procedures knowledge of centre of gravity points	crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.09	Directs operator to apply sufficient lifting strain, so that component will not move when disconnected from main framework.	knowledge of hoisting signals	crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.10	Disconnects component by appropriate method.	knowledge of SWP	power or hand

Sub-tasks	Enabling Objectives	Tools & Equipment
	knowledge of detensioning cables	wrenches, cutting equipment
	knowledge of dismantling methods	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.11	Directs hoisting operator to hoist, swing or lower material to ground or floor level.	knowledge of hoisting signals	crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

18.12	Prepares material for shipment.	ability to calculate weights knowledge of storage procedures	dollies, rollers, jacks, fork lift, truck, crane, A-frame hoisting device, dunnage

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

BLOCK F REINFORCING CONCRETE

Task 19 **Positions and secures steel bar or wire mesh reinforcing in forms prior to the pouring of concrete for grade beams, footings, walls, floors, columns, caissons and other components.**

Trend: Greater use of corrosion-resistant reinforcing bar; tendency toward emphasis on mechanical splicing, tighter spacing and heavier bar in earthquake areas; inclusion of post-tensioning and prestressing as part of job; compliance with earthquake codes; greater emphasis on workers' knowledge and responsibility as well as on their safety.

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.01	Prepares job site by planning assembly areas, shop location, laydown areas, cranes location, etc.	knowledge of SWP knowledge of construction sequence knowledge of equipment requirements knowledge of symbols pertinent to the trade ability to read and interpret drawings, cutting sheets and detail sheets	dunnage, site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.02	Off-loads, identifies and sorts reinforcing steel according to size and type.	knowledge of materials knowledge of hoisting signals knowledge of and ability to apply rigging skills ability to calculate load weights knowledge of breaking strengths knowledge of strength of receiving area ability to interpret drawings for allowable dead loads knowledge of and ability to interpret reinforcing bar code knowledge of colour codes	crane, dunnage, crowbar, rigging equipment, chokers, spreaders

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.03	Marks location of reinforcing bar on form surfaces.	ability to interpret drawings and detail sheets	spray paint, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

19.04 Reads and interprets detail sheets, shop drawings and working drawings.

ability to read and interpret detail sheets, shop drawings and working drawings

ability to prepare detail sheets

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

19.05 Selects appropriate reinforcing material.

knowledge of materials

ability to interpret drawings and detail sheets

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

19.06 Identifies and installs chairs, beam bolsters, slab spacers, bar spacers, etc.

knowledge of clearance standards

knowledge of materials

ability to read and interpret drawings

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.07	Cuts and bends reinforcing bar to meet specifications and on-site requirements.	knowledge of equipment knowledge of pin diameter formulae knowledge of SWP	crane, bending plate, torch, shear line, bending machine, bolt cutters, hickey bar, cutoff saw

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.08	Preassembles and positions steel bars or wire mesh at predetermined locations.	knowledge of crane signals knowledge of rigging procedures knowledge of reinforcing bar ties ability to read and interpret drawings, detail sheets and cutting sheets	crane, tie wire, pliers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.09	Directs crane operator to hoist reinforcing bar preassembly into position.	knowledge of hoisting signals knowledge of safe rigging practices ability to calculate weights	crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.10	Secures reinforcing bar and/or wire mesh in place by means of mechanical splicing, tying, welding or other means.	knowledge of materials knowledge of reinforcing bar ties and appropriate applications knowledge of mechanical splices	welding equipment, hydraulic crimper

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.11	Verifies that installation meets specifications.	knowledge of materials knowledge of the purpose of reinforced concrete knowledge of clearances ability to read and interpret drawings	wrecking bar, hickey bar

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

19.12	Ensures reinforcing bar assembly remains stable during concrete pour.	knowledge of materials knowledge of the purpose of reinforced concrete knowledge of clearances ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

Task 20 **Post-tensions tendons (steel cables or rods) in cast-in-place or precast concrete for reinforcement purposes.**

Trend: Greater degree of sophistication in equipment and materials; greater responsibility to attend to details; greater focus on compliance with job specifications. These skills are being increasingly applied to fabric roofs, cable-stay bridges, rehabilitation of existing structures, roof support and starch-type buildings.

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.01	Prepares job site by planning a dry laydown	knowledge of job sequence and requirements	

	Sub-tasks	Enabling Objectives	Tools & Equipment

area and crane location areas.

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.02 Off-loads, identifies and sorts components, equipment and materials.

Enabling Objectives:
- knowledge of hoisting signals
- knowledge of rigging procedures
- knowledge of materials and components
- knowledge of SWP

Tools & Equipment: crane, rigging equipment, nylon straps

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.03 Calibrates and cleans stressing equipment.

Enabling Objectives:
- knowledge of calibration method
- knowledge of equipment

Tools & Equipment: load cell, brushes, gauges, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.04 Reads and interprets prestress drawings and shop drawings.

Enabling Objectives:
- knowledge of shop drawings
- knowledge of prestress drawings
- knowledge of various post-tension (PT) systems and drawings

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.05	Verifies and marks tendon locations on concrete forms.	ability to read and interpret drawings	paint, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.06	Notifies appropriate authorities of necessary changes.	knowledge of and ability to use communication skills knowledge of procedures	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.07	Drills and/or verifies correct locations of holes in forms for anchoring systems.	ability to read and interpret drawings	electric drill, jig saw, hole saw

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.08	Positions and secures anchorages and bursting steel.	ability to read and interpret drawings	socket wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.09	Marks the profile of the tendon.	ability to read and interpret drawings	paint, stapler

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.10	Cuts, positions and secures supports and conduit at specified locations.	knowledge of and ability to read and interpret PT drawings knowledge of equipment	cutoff saw, torch, stapler, bolt cutters

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.11	Selects, cuts and lays out tendon according to specifications.	ability to read and interpret drawings knowledge of equipment knowledge of materials	tugger, cutoff saw, cable pusher, decoiler, fish line

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.12	Connects tendon to anchorages.	knowledge of installation procedures	utility knife with hook blades

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.13	Protects all exposed tendons with suitable materials.	knowledge of installation procedures knowledge of materials	utility knife, specialized tape

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.14	Applies approved protection material to exclude concrete.	knowledge of installation procedures knowledge of materials	Tiger torch, utility knife, duct tape, grease, specialized tape

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.15	Secures all dead ends of tendon according to specifications.	ability to read and interpret drawings	stressing equipment, swagger

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.16	Conducts visual inspection of tendon and anchorage and repairs to specifications, if required.	knowledge of specifications ability to read and interpret drawings	tape, grease, caulking, utility knife

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.17	Ensures assembled components remain stable during concrete pour.	knowledge of specifications	stapler

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.18	Removes pocket-forming devices.	knowledge of procedures	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.19	Inspects and cleans anchorage, if necessary.	knowledge of specifications knowledge of job sequence and requirements	cleaning equipment

	Sub-tasks	Enabling Objectives	Tools & Equipment
		knowledge of SWP	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.20	Installs wedges.	knowledge of procedures	setting tool

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.21	Marks tendon to determine elongation.	knowledge of procedures	paint, tape

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.22	Reads and interprets stressing data.	ability to interpret charts	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.23	Determines stressing sequence.	knowledge of and ability to read and interpret PT drawings ability to interpret charts	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.24	Positions stressing equipment.	knowledge of equipment	crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.25	Installs safety barriers around work area.	knowledge of SWP	safety tape, safety barriers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.26	Stresses tendon to required tension and elongation.	knowledge of stressing procedures and equipment	stressing equipment, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.27	Documents elongation and gauge pressure on tendon.	ability to read and interpret gauge	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.28	Locks tendon in position.	knowledge of stressing procedures and equipment	stressing equipment, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.29	Disengages stressing equipment.	knowledge of stressing procedures and equipment	crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
20.30	Destresses tendon by approved methods, if required.	knowledge of appropriate methods knowledge of equipment knowledge of appropriate job procedures	stressing equipment, crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.31	Cuts off excess tendon.	knowledge of appropriate job procedures knowledge of materials	torch, hydraulic cable cutter, cutoff saw

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.32	Installs grease cap and patches pockets where necessary.	knowledge of materials knowledge of procedures knowledge of sealants and caulking	grease gun, caulking gun, slag hammer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

20.33	Applies grout to voids in duct where necessary.	knowledge of procedures knowledge of materials knowledge of SWP ability to formulate grout	grout pump and accessories, compressor

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	no	yes	yes	ND	ND

BLOCK G MOVING AND INSTALLATION OF ROBOTIC EQUIPMENT

Task 21 **Erects and installs robotic equipment for material handling and automated mechanical systems.**

Trend: Factory modularization resulting in a lesser degree of field fabrication; higher competency level required for installation procedures.

	Sub-tasks	Enabling Objectives	Tools & Equipment
21.01	Prepares job site by planning for laydown areas, storage areas, pre-assembly areas, access, etc.	knowledge of component structure and function knowledge of the delicate nature of materials knowledge of job sequence	fork lift, carry-deck crane

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.02	Off-loads and inventories equipment, components and materials.	knowledge of materials knowledge of erection sequence knowledge of finishes knowledge of bills of lading knowledge of material lists knowledge of manufacturer's handling specifications ability to identify components	wrecking bar, fork lift, dunnage, hoisting equipment, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
21.03	Identifies, sorts and properly stores components and materials according to job progress requirements.	knowledge of job sequence knowledge of proper storage environment ability to identify components ability to assess suitability of storage areas	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.04	Inspects components and removes shipping stays, as necessary.	knowledge of component structure and function knowledge of shipping practices	torch, socket wrenches, screwdriver, Allen wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.05	Preassembles components, if required.	knowledge of component structure and function knowledge of and ability to use precision tools	socket wrenches, Allen wrenches, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.06	Lays out grid lines and shoots elevations.	knowledge of survey procedures and use of equipment ability to read and interpret drawings	transit, builder's level, survey equipment, plumb bob, chalk

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	no	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
21.07	Installs anchorages in accordance with specifications.	knowledge of welding and cutting procedures knowledge of traditional and chemical anchoring systems ability to read and interpret drawings	hammer drill, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	no	ND	ND

21.08	Fabricates, erects or places supports in accordance with specifications.	ability to read and interpret drawings ability to identify parts and material	torch, welding machine, carry-deck crane, hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.09	Completes assembly of robotic components.	knowledge of manufacturer's specifications knowledge of component structure and function ability to read and interpret drawings	socket wrenches, feeler gauge, Allen wrenches, micrometer

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.10	Rigs, handles and places components.	knowledge of manufacturer's rigging specifications	rigging equipment, nylon slings, eye bolt

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
21.11	Levels and aligns components to specifications.	knowledge of use of precision measuring and levelling equipment ability to read specifications ability to read and interpret drawings	machinist's level, micrometer, feeler gauge, shims

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	no	ND	ND

21.12	Fastens components into position according to specifications.	knowledge of application of manufacturer's specifications knowledge of trade practices	hand wrenches, spanners, socket wrenches, Allen wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.13	Installs or connects hydraulic and pneumatic systems.	knowledge of manufacturer's specifications ability to read and interpret drawings	adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	no	ND	ND

21.14	Conducts final alignment of components.	knowledge of use of precision measuring and levelling equipment knowledge of levelling and alignment procedures knowledge of manufacturer's specifications	socket wrenches, machinist's level, micrometer, feeler gauge, shims

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	no	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
21.15	Installs safety systems and protective devices according to codes and specifications.	knowledge of manufacturer's specifications knowledge of applicable codes and regulations ability to read and interpret drawings	adjustable wrenches, hammer drill, socket wrenches, welding and cutting equipment, torch

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

21.16	Starts up, inspects and troubleshoots system.	knowledge of components and interactive function	socket wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	no	ND	NV	yes	yes	yes	yes	yes	ND	ND

BLOCK H ERECTION OF SCAFFOLDS, FALSEWORK AND OTHER WORKING PLATFORMS

Task 22 Erects temporary frame or tube scaffolds, falsework, shoring, etc.

Trend: No apparent change.

	Sub-tasks	Enabling Objectives	Tools & Equipment
22.01	Prepares job site by planning for laydown areas, storage areas,	knowledge of erection procedures knowledge of SWP	site preparation equipment

	Sub-tasks	Enabling Objectives	Tools & Equipment
	preassembly areas, access, etc.	ability to read and interpret drawings	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.02	Off-loads components.	knowledge of hoisting signals knowledge of rigging procedures knowledge of materials and components knowledge of SWP knowledge of care and handling of finished materials	fork lift, crane, rigging equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.03	Inspects components for defects.	knowledge of SWP knowledge of components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.04	Ensures that the site is sound and level.	knowledge of standard work procedures	transit, level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
22.05	Prepares, positions and levels sills, baseplates, timbers and jackscrews, where necessary.	knowledge of erection sequence	transit, level

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.06	Assembles and secures frames, tubes, posts, braces, ladders or other components according to specifications and codes.	knowledge of assembling methods knowledge of standard work procedures ability to interpret working drawings	crowbar, tag lines, crane, hand tools, locks, plate clamps, couplers, sledgehammers, welding and cutting equipment, hydraulic and mechanical jacks

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.07	Aligns, levels and plumbs structure as erection progresses.	knowledge of levelling procedures	transit, level, shims

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.08	Installs guy wires or outriggers as erection progresses.	knowledge of rigging procedures	guy wires, outriggers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
22.09	Lays wood, steel or aluminum planks at working level.	knowledge of rigging procedures knowledge of WCB rules and regulations	#9 wire, pliers

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.10	Installs toe boards and guard rails at working level.	knowledge of safety codes and regulations	fastening equipment, welding and cutting equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.11	Inspects scaffold or falsework to ensure all components are properly installed and secured.	knowledge of SWP knowledge of components	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

22.12	Performs periodic inspection of scaffolding or falsework.	knowledge of procedures for servicing and maintaining movable and powered scaffolds knowledge of the effects of overloads	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Sub-tasks		Enabling Objectives	Tools & Equipment
22.13	Dismantles scaffold or falsework at completion of construction.	knowledge of dismantling procedures	torch, power tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Task 23 Suspends scaffolds from structures.

Trend: No apparent change.

Sub-tasks		Enabling Objectives	Tools & Equipment
23.01	Inspects all components for defects.	knowledge of SWP knowledge of rigging procedures knowledge of knots ability to interpret Construction Safety Act, WCB and company standards and regulations knowledge of functions and features of hanging scaffolds	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

23.02	Reinspects outriggers, counterweights and points of support.	knowledge of types and characteristics of points of support for hanging scaffolds	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
23.03	Attaches counterweights to outriggers and secures to proper points.	knowledge of safe fastening methods	tag lines, socket wrenches, adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

23.04	Attaches cables, lifting blocks and hoisting units to scaffold and outriggers.	knowledge of SWP knowledge of rigging procedures knowledge of equipment	

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

23.05	Attaches worker's safety line to secure point at proper location.	knowledge of SWP knowledge of the value of periodic inspection knowledge of WCB rules and regulations knowledge of false arrest procedures	personal protective equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

23.06	Dismantles scaffold equipment at completion of construction operations.	knowledge of methods of maintaining and storing scaffold material after use	tag lines, socket wrenches, adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

BLOCK I ERECTION OF WOOD STRUCTURES

Task 24 **Erects structural wood material for buildings (such as mine product storage) churches, schools, pedestrian bridges and walkways.**

Trend: No apparent change.

Sub-tasks	Enabling Objectives	Tools & Equipment
24.01 Prepares job site for storage of material.	knowledge of erection procedures	site preparation equipment

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Sub-tasks	Enabling Objectives	Tools & Equipment
24.02 Off-loads structural wood material.	knowledge of SWP knowledge of rigging procedures knowledge of lifting capacity of hoisting equipment	crane, fork lift, rigger's belt, rigging equipment, dunnage

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Sub-tasks	Enabling Objectives	Tools & Equipment
24.03 Inventories components and stores material in a safe manner.	knowledge of job sequence	wood supports, shores

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

Sub-tasks	Enabling Objectives	Tools & Equipment
24.04 Assembles sections of structural wood material.	knowledge of assembly and erection methods	drill, bolts

Sub-tasks		Enabling Objectives		Tools & Equipment
		ability to read and interpret drawings		

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.05	Connects components to hoisting equipment.	knowledge of rigging procedures		slings, chokers, spreaders, lashing

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.06	Directs operator to lift and spot columns, beams and other components into position.	knowledge of hoisting signals		

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.07	Plumbs up components.	knowledge of erection procedures		wire rope cable, turnbuckles

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.08	Brings components to proper elevation and installs bracing and framing.	knowledge of levelling procedures ability to use surveying equipment		shims, jacks, grout, wedges, level, transit

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

	Sub-tasks	Enabling Objectives	Tools & Equipment
24.09	Brings components to complete alignment.	knowledge of techniques for checking line knowledge of and familiarity with effects of improper alignment ability to use surveying equipment	plumb bob, level, transit

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.10	Secures components in place by bolting or welding according to specifications.	knowledge of fastening methods	welding equipment, adjustable wrenches

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

24.11	Removes all plumb cables after building is secure.	knowledge of rigging procedures	hand tools

NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK
ND	ND	yes	ND	NV	yes	yes	yes	yes	yes	ND	ND

TOOLS AND EQUIPMENT

adjustable wrenches
bolt bag(s)
bolt cutter
bull pin
burning glasses
C-clamps
centre punch
chain and ladder hook
chalk holder
chalk line
chisel
clip wrench (30 cm adjustable)
coke
combination square (3 cm)
connecting bar
coveralls
decoiler
electric drill and bits
fire extinguishers
flat screwdriver
forge
funnels
gloves
grinder
grinding wheels
grout mixer, pump and accessories
hacksaw and blades
hammers (various types)
hard hat
hearing protection
hydraulic pump
lanyard
leather jacket
medium file
nylon slings
open-end wrenches (2 sizes)
Phillips screwdrivers (2 sizes)
pipe wrench
pliers
plumb bob
portable cutoff saw
power cords
propane
reels
respirator
rivet buster (long tong)
riveting gun
Robertson screwdrivers (4 sizes)
rod bag
rod oven
rubber mallet
safety belt
safety boots
safety glasses
safety harness
safety scaffolds
scriber
side cutter
sledgehammers
socket set
spud wrenches (various sizes)
square
stapler
stressing adapters, stressing rods and accessories
stressing jack
striker
tape measure
tarps
tin snips
tongs
torch
torch lighter
torpedo level
two-way radios
utility knife
vice grips
welding gloves
welding helmet
welding machine
winch and tuggerwire brush
wire mesh pulling grips
wire reels

GLOSSARY

becket	a device used to connect cable to a block or boom.
bridle (cradle)	two or more slings used to lift a load.
bull pin	a tapered pin for lining up material.
bursting steel	reinforcing steel used to prevent bursting of concrete during and after post-tensioning.
cathead	a sheave assembly.
chairs	reinforcing bar support.
choker	wire rope or fabric sling with eye splice or loop at each end.
clip wrench	adjustable wrench.
come-along	a hand operated device used to pull cable or chain or for hoisting loads.
curtain wall	an exterior building wall which carries no roof or floor loads composed principally of metal, but which may contain glass or other surface materials.
dog	an L-shaped metal instrument used to align plates.
drift pin	a round tapered piece of metal used to align holes.
dunnage	blocking (usually wood) to temporarily support equipment and material off the ground.
fid	wooden spike for splicing fibre rope.
frog	leather holder for spud wrenches.
girder	a beam that supports roof or floor load weights.
grommet sling	an endless sling of fibre rope.

headache ball	a counterweight on a line.
hickey bar	steel bar for bending reinforcing bars.
jig	a device used in holding materials for bending, drilling or welding.
joist	intermediate structure that supports roof or floor load weights.
key	metal device used to align tank walls.
lash	a random length of cable secured by cable clamps and used to temporarily secure loads.
marline spike	metal spike for splicing wire rope.
match mark	coding components for the purpose of proper reassembly.
plumb	aligned and level.
profile	proper elevations and locations of post-tension cable.
sag rod	a vertical supporting rod between two members.
snatch block	interlocking hoisting block.
spud wrench	pointed wrenches for lining up materials.
stirrups	deformed or plain bars bent to support and contain the longitudinal bars of a beam, girder, etc.
suitcase	a multi-sheaved block.
swayger	hydraulic crimping machine.
tag line	line used for guiding loads during hoisting or moving to prevent swinging.
thimble	curved metal plate for protecting rope or wire eyes from chaffing or cutting.
tie rod	a horizontal fastening rod between two members.
Tirfor	a hand operated pulling or hoisting device.

tugger	compressor operated hoisting device.
turnbuckle	a device attached to wire rope for making limited adjustments in lenght; it consists of a barrel and right and left hand treaded bolts.
U-bolt	a semi-circular rod with threaded ends.

PERCENTAGE RATINGS

BLOCK A SAFETY, ACCIDENT PREVENTION AND FIRST AID

Task 1 Practices safety and maintains a safe work environment.

BLOCK B JOB PLANNING AND PREPARATION

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	5	ND	NV	5	5	6	5	3	ND	ND	5%

Task 2 Plans job in accordance with drawings, work site requirements and specifications.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	50	ND	NV	20	20	20	60	50	ND	ND	37%

Task 3 Coordinates delivery and installation of materials and equipment as job progresses.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	50	ND	NV	80	80	80	40	50	ND	ND	63%

BLOCK C RIGGING AND MACHINERY MOVING

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	3	ND	NV	10	10	14	15	20	ND	ND	12%

Task 4 Prepares wire and fibre ropes and tackle.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	20	ND	NV	55	80	10	50	20	ND	ND	39%

Task 5 Rigs and moves loads.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	80	ND	NV	45	20	90	50	80	ND	ND	61%

BLOCK D ERECTION OF HOISTING AND CONVEYANCE EQUIPMENT

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	2	ND	NV	18	10	12	8	11	ND	ND	10%

Task 6 Assembles, erects, jumps and dismantles tower cranes.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	30	15	15	20	11	ND	ND	15%

Task 7 Assembles, erects, jumps and dismantles various derrick types.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	20	5	5	5	5	ND	ND	7%

Task 8 Assembles and dismantles conventional and hydraulic cranes.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	2	ND	NV	15	35	25	30	22	ND	ND	22%

Task 9 Assembles, erects, jumps and dismantles material and personnel hoists.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	28	ND	NV	12	10	5	15	7	ND	ND	13%

Task 10 Installs support structures, framework and related structural and mechanical equipment for conveying systems and material handling systems.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	70	ND	NV	23	35	50	30	55	ND	ND	43%

BLOCK E ERECTION OF STRUCTURAL IRONWORK

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	55	ND	NV	37	30	51	35	34	ND	ND	40%

Task 11 Erects structural steel framework for buildings, bridges and towers.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	40	ND	NV	20	40	60	30	53	ND	ND	40%

Task 12 Erects metal storage tanks, bins and hoppers.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	10	ND	NV	10	5	10	10	6	ND	ND	9%

Task 13 Assembles and erects pre-engineered buildings, bridges, silos, and similar structures.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	15	ND	NV	12	10	5	15	6	ND	ND	11%

Task 14 Assembles and installs curtain walls, window walls, doorways, store fronts, revolving doors, mantraps, etc., in and on buildings.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	5	ND	NV	15	5	10	10	6	ND	ND	9%

Task 15 Installs ornamental and miscellaneous ironwork and non-ferrous components, such as stairways, railings, panels, catwalks, fences, sound barriers, vehicle guard rails, etc.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	5	ND	NV	15	20	5	15	12	ND	ND	11%

Task 16 Erects structural and architectural precast concrete components for buildings, bridges, towers and other structures.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	15	ND	NV	8	10	5	15	12	ND	ND	11%

Task 17 Inspects or tests structures and equipment for deterioration, defects, non-compliance with specifications or regulations and unsafe conditions during or after construction.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	5	ND	NV	7	5	2	2	2	ND	ND	4%

Task 18 Dismantles building framework, bridges, tanks, silos or other structures made of metal, precast concrete or laminated timbers.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	5	ND	NV	13	5	3	3	3	ND	ND	5%

BLOCK F **REINFORCING CONCRETE**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	25	ND	NV	5	25	0	29	25	ND	ND	18%

Task 19 Positions and secures steel bar or wire mesh reinforcing in forms prior to the pouring of concrete for grade beams, footings, walls, floors, columns, caissons and other components.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	90	ND	NV	85	80	0	80	80	ND	ND	83%

Task 20 Post-tensions tendons (steel cables or rods) in cast-in-place or precast concrete for reinforcement purposes.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	10	ND	NV	15	20	0	20	20	ND	ND	17%

BLOCK G **MOVING AND INSTALLATION OF ROBOTIC EQUIPMENT**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	15	5	5	1	1	ND	ND	5%

Task 21 Erects and installs robotic equipment for material handling and automated mechanical systems.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	100	100	100	100	100	ND	ND	100%

BLOCK H **ERECTION OF SCAFFOLDS, FALSEWORK AND OTHER WORKING PLATFORMS**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	10	ND	NV	8	10	9	5	5	ND	ND	8%

Task 22 Erects temporary frame or tube scaffolds, falsework, shoring, etc.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	90	ND	NV	40	80	50	50	70	ND	ND	63%

Task 23 Suspends scaffolds from structures.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	10	ND	NV	60	20	50	50	30	ND	ND	37%

BLOCK I **ERECTION OF WOOD STRUCTURES**

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	2	5	3	2	1	ND	ND	2%

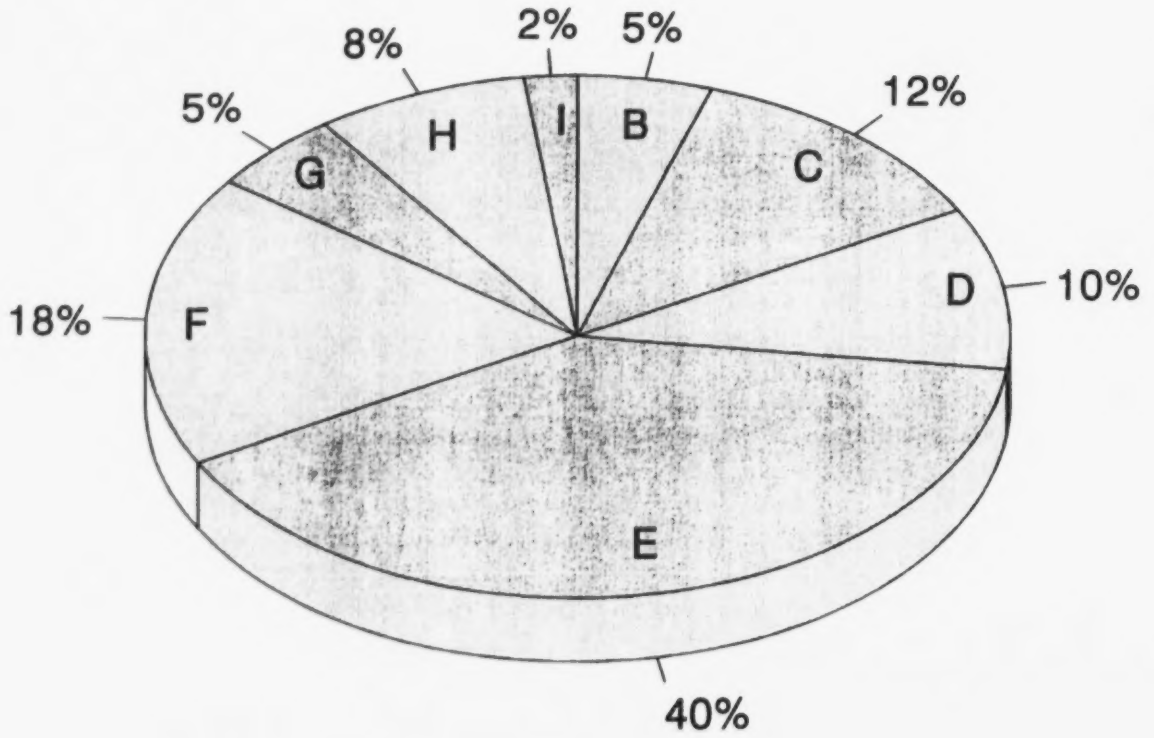
Task 24 Erects structural wood material for buildings (such as mine product storage), churches, schools, pedestrian bridges and walkways.

%	NF	NS	PE	NB	PQ	ON	MA	SK	AB	BC	NT	YK	Nat. Avg.
	ND	ND	0	ND	NV	100	100	100	100	100	ND	ND	100%

BLOCK PERCENTAGES

BLOCK PERCENTAGES*

Ironworker (Generalist)



* The average time a worker spends performing each block in a given year in relation to other blocks of the analysis, taking into consideration the complexity (importance plus difficulty) of the block.

TITLES OF BLOCKS

A	SAFETY, ACCIDENT PREVENTION AND FIRST AID**
B	JOB PLANNING AND PREPARATION
C	RIGGING AND MACHINERY MOVING
D	ERECTION OF HOISTING AND CONVEYANCE EQUIPMENT
E	ERECTION OF STRUCTURAL IRONWORK
F	REINFORCING CONCRETE
G	MOVING AND INSTALLATION OF ROBOTIC EQUIPMENT
H	ERECTION OF SCAFFOLDS, FALSEWORK AND OTHER WORKING PLATFORMS
I	ERECTION OF WOOD STRUCTURES

** Since safety practices are a mandatory feature of all occupations, they are considered common core, ratings are not required and thus Block A does not appear on the chart.